

CLAIMS

1. A molding composition which comprises a blend formed from at least the following components: (A) a thermoplastic polyamide or thermoplastic polyester polymer, said polymer being unreinforced, reinforced, or filled, (B) at least one organic halogen-containing flame retardant, (C) a zinc borate, a mixed oxide of zinc and boron, or zinc sulfide, or a mixture of any two or more of the foregoing; and (D) an olefin-based polymer.
2. A composition of claim 1 wherein (A) is nylon 6 or nylon 6,6 and wherein (D) is a propylene-based polymer.
3. A composition of claim 1 wherein (B) is at least one polybromoaromatic compound containing at least 50% by weight of bromine.
4. A composition of claim 1 wherein (B) is a polybromostyrenic polymer containing at least 58% by weight of bromine.
5. A composition of claim 1 wherein (B) is a polybromostyrenic polymer containing at least 65% by weight of bromine.
6. A composition of claim 1 wherein (C) is a dodecaboron tetrazine docosaoxide hydrate.
7. A composition of claim 1 wherein (D) is a propylene homopolymer having a melt flow index of not more than about 5 grams/10 minutes.
8. A composition of claim 1 wherein the components used in forming said composition further include at least one polymeric anti-dripping agent.

9. A composition of claim 8 wherein the anti-dripping agent is a polyfluoroethylene polymer.

10. A composition of claim 8 wherein the anti-dripping agent is an ethylene/methacrylic acid copolymer.

11. A composition of claim 1 wherein the components used in forming said composition further comprise a CTI-increasing amount of an organic polymer of silicon absorbed on fumed silica.

12. A composition of claim 1 wherein the components used in forming said composition further comprise a CTI-increasing amount of an organic polymer of silicon predispersed in a polyamide or polyester resin.

13. A composition of claim 11 wherein the organic polymer of silicon is a polysiloxane polymer.

14. A composition of claim 12 wherein the organic polymer of silicon is a polysiloxane polymer.

15. A composition of claim 13 wherein the polymer of silicon is a poly(dimethylsiloxane) polymer.

16. A composition of claim 14 wherein the polymer of silicon is a poly(dimethylsiloxane) polymer.

17. A composition of claim 2 wherein (B) is at least one polybromoaromatic compound containing at least 50% by weight of bromine.

18. A composition of claim 2 wherein (B) is a polybromostyrenic polymer containing at least 58% by weight of bromine.

19. A composition of claim 2 wherein (B) is a polybromostyrenic polymer containing at least 65% by weight of bromine.

20. A composition of claim 2 wherein (C) is a dodecaboron tetrazinc docosaoxide hydrate.

21. A composition of claim 17 wherein (C) is a dodecaboron tetrazinc docosaoxide hydrate.

22. A composition of claim 18 wherein (C) is a dodecaboron tetrazinc docosaoxide hydrate.

23. A composition of claim 19 wherein (C) is a dodecaboron tetrazinc docosaoxide hydrate.

24. A composition of claim 2 wherein (D) is a propylene homopolymer having a melt flow index of not more than about 5 grams/10 minutes.

25. A composition of claim 17 wherein (D) is a propylene homopolymer having a melt flow index of not more than about 5 grams/10 minutes.

26. A composition of claim 18 wherein (D) is a propylene homopolymer having a melt flow index of not more than about 5 grams/10 minutes.

27. A composition of claim 19 wherein (D) is a propylene homopolymer having a melt flow index of not more than about 5 grams/10 minutes.

28. A composition of claim 20 wherein (D) is a propylene homopolymer having a melt flow index of not more than about 5 grams/10 minutes.

29. A composition of claim 21 wherein (D) is a propylene homopolymer having a melt flow index of not more than about 5 grams/10 minutes.

30. A composition of claim 22 wherein (D) is a propylene homopolymer having a melt flow index of not more than about 5 grams/10 minutes.

31. A composition of claim 23 wherein (D) is a propylene homopolymer having a melt flow index of not more than about 5 grams/10 minutes.

32. A composition of claim 2 wherein the components used in forming said composition further include at least one polymeric anti-dripping agent.

33. A composition of claim 17 wherein the components used in forming said composition further include at least one polymeric anti-dripping agent.

34. A composition of claim 18 wherein the components used in forming said composition further include at least one polymeric anti-dripping agent.

35. A composition of claim 19 wherein the components used in forming said composition further include at least one polymeric anti-dripping agent.

36. A composition of claim 24 wherein the components used in forming said composition further include at least one polymeric anti-dripping agent.

37. A composition of claim 25 wherein the components used in forming said composition further include at least one polymeric anti-dripping agent.

38. A composition of claim 26 wherein the components used in forming said composition further include at least one polymeric anti-dripping agent.

39. A composition of claim 27 wherein the components used in forming said composition further include at least one polymeric anti-dripping agent.

40. A composition of claim 33 wherein the anti-dripping agent is a polyfluoroethylene polymer.

41. A composition of claim 35 wherein the anti-dripping agent is a polyfluoroethylene polymer.

42. A composition of claim 33 wherein the anti-dripping agent is an ethylene/methacrylic acid copolymer.

43. A composition of claim 35 wherein the anti-dripping agent is an ethylene/methacrylic acid copolymer.

44. A composition of claim 2 wherein the components used in forming said composition further comprise a CTI-increasing amount of an organic polymer of silicon absorbed on fumed silica.

45. A composition of claim 25 wherein the components used in forming said composition further comprise a CTI-increasing amount of an organic polymer of silicon absorbed on fumed silica.

46. A composition of claim 27 wherein the components used in forming said composition further comprise a CTI-increasing amount of an organic polymer of silicon absorbed on fumed silica.

47. A composition of claim 44 wherein the organic polymer of silicon is a polysiloxane polymer.

48. A composition of claim 45 wherein the organic polymer of silicon is a polysiloxane polymer.

49. A composition of claim 46 wherein the organic polymer of silicon is a polysiloxane polymer.

50. A composition of claim 47 wherein the polysiloxane polymer is a poly(dimethylsiloxane) polymer.

51. A composition of claim 48 wherein the polysiloxane polymer is a poly(dimethylsiloxane) polymer.

52. A composition of claim 49 wherein the polysiloxane polymer is a poly(dimethylsiloxane) polymer.

53. An article molded from a composition of any of claims 1, 2, 4, 6, 7, 8, or 27.

54. An article of claim 53 wherein the article contains glass fiber or a mineral filler, or both.

55. A method of increasing the flame retardancy and comparative tracking index of a thermoplastic polyamide or a thermoplastic polyester, which method comprises blending with the polyamide or polyester at least the components of any of claims 4, 7, or 35 to form a molding composition.

56. A method of claim 55 further comprising molding said molding composition while in molten condition.

57. A method of claim 56 further comprising performing said molding with glass fiber or mineral filler, or both, included in the molten composition.

58. A method of producing a polyamide article or a polyester article having increased flame retardancy and comparative tracking index, which method comprises molding a melt blend of any of claims 4 or 7.

59. A method of claim 58 further comprising performing said molding with glass fiber or mineral filler, or both, included in the melt blend.

60. A flame retardant additive composition which comprises (i) at least one organic halogen-containing flame retardant, (ii) a zinc borate, a mixed oxide of zinc and boron, or zinc sulfide or any combination of any two or more of these, and (iii) an olefin-based polymer, in proportions of 0.5 to 40 parts by weight of (i) and 0.3 to 12 parts by weight of (ii) per part by weight of (iii).

61. An additive composition of claim 60 further comprising (iv) up to 2 parts by weight of polymeric anti-dripping agent, (v) up to 3 parts by weight of an organic silicon-containing polymer used as the polymer absorbed on fumed silica, (vi) up to 5 parts by weight of organic silicon-containing polymer dispersed in a polyamide or polyester resin, and/or (vii) up to 10 parts by weight of processing, stabilizing, impact strength, and/or compatibilizing additives per part by weight of the olefin-based polymer present therein, at least one of (iv)-(vii) being present in said additive composition.

62. An additive composition of claim 60 wherein (iii) is a polypropylene homopolymer having a melt flow index of not more than about 5 grams/10 minutes.

63. An additive composition of claim 61 wherein (iii) is a polypropylene homopolymer having a melt flow index of not more than about 5 grams/10 minutes.

64. An additive composition of claim 60 wherein (i) is at least one polybromoaromatic compound containing at least 50% by weight of bromine.

65. An additive composition of claim 61 wherein (i) is at least one polybromoaromatic compound containing at least 50% by weight of bromine.

66. An additive composition of claim 62 wherein (i) is at least one polybromoaromatic compound containing at least 50% by weight of bromine.

67. An additive composition of claim 63 wherein (i) is at least one polybromoaromatic compound containing at least 50% by weight of bromine.

68. An additive composition of any of claims 64 or 66 wherein said polybromoaromatic compound is a polybromostyrenic polymer containing at least 58% by weight of bromine.

69. An additive composition of claim 68 wherein said polybromostyrenic polymer contains at least 65% by weight of bromine, and wherein (ii) is a dodecaboron tetrazine dicosaoxide hydrate.

70. A composition of any of claims 1, 4, or 7 wherein (C) is zinc borate or a mixed oxide of boron and zinc.

71. A composition of any of claims 1, 4, or 7 wherein (C) is zinc borate monohydrate.

72. A composition of any of claims 1, 4, or 7 wherein (C) is anhydrous zinc borate.